INSECTS OF MICRONESIA
Coleoptera: Anthicidae[1]

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INTRODUCTION

Anthicid beetles are small insects, of worldwide distribution. Their role in nature seems to be that of microscavengers, the adults and larvae feeding on dead insects, decaying plants, and other material, although very little is known of their actual feeding habits. They are occasionally found in damp grain and in similar places but they cannot be counted as principal pests even here, as they do not enter until the grain has already spoiled. This report summarizes the available information on the species known from Micronesia.

The United States Office of Naval Research, the Pacific Science Board (National Research Council), the National Science Foundation, and Bernice P. Bishop Museum have made this survey and the publication of the results possible. Field research was aided by a contract between the Office of Naval Research, Department of the Navy, and the National Academy of Sciences, NR 160-175.

I wish to thank Henry S. Dybas of the Chicago Natural History Museum and L. W. Quate of B. P. Bishop Museum for the loan of specimens in their care. The study would not have been possible without their cooperation. The lot sent by Bishop Museum contains much material borrowed for the study from other collections.

The following symbols indicate the museums in which primary types will be housed: US (United States National Museum), BISHOP (Bernice P. Bishop Museum), and CM (Chicago Natural History Museum). Paratypes and identified specimens are also in the California Academy of Sciences, Museum of Comparative Zoology, Hawaiian Sugar Planters' Association Experiment Station, Kyushu University, U.S.D.A. Bureau of Entomology and Plant Quarantine station at Pearl Harbor, California Plant Quarantine, State Department of Agriculture, Honolulu, and my collection.

[1] This represents, in part, Results of Professor T. Esaki's Micronesian Expeditions (1936-1940), No. 120.

ZOOGEOGRAPHY

Several species of Anthicidae are almost cosmopolitan. One of these, *Anthicus tobias* Marseul, has been collected in the Marianas, but *A. floralis* (Linnaeus), the most widespread species, has not yet been found in Micronesia though it has reached the Hawaiian Islands. Two species, *Formicomus imperator* (LaFerté) and *Anthicus confucii* Marseul, are widespread in the Orient and have probably reached Micronesia through the agency of man.

The remaining species appear to belong in Micronesia, but have affinities with the fauna of the East Indies and the Orient. *Anthicus oceanicus* LaFerté is the most widely distributed species. Interestingly enough, it has been reported not only from as far east as the Marquesas, the type locality, but west to the islands of the Indian Ocean and to northern Australia. This species could also have been introduced or moved around by man. Of the new species, the closely related *Anthicus vexator* has not been found west of Micronesia but has been taken on Canton Island and in the Hawaiian Islands to the east; *Anthicomorphus pacificus,* and *Anthicus insularis, A. carolinensis,* and *A. dybasi,* have not been taken outside of Micronesia. Because of the incomplete knowledge of the anthicid fauna of Melanesia, New Guinea, and the East Indies, even the species that now seem to be Micronesian endemics may eventually turn out to be introductions from adjacent areas. *Anthicomorphus pacificus* is the only species that has been collected in the mountains of the Palaus and it is the one most likely to be truly endemic.

SYSTEMATICS

The limits of the family Anthicidae used here are those now generally accepted. The Micronesian species belong to relatively few species groups, all apparently with affinities to the west. *Formicomus* and *Anthicomorphus* are known only from the Old World. *Anthicus* is worldwide but the Micronesian species all belong to groups with relationships to the faunas of the East Indies and the Orient. A world revision of the genera of Anthicidae is badly needed but the Micronesian species must remain in *Anthicus* until it is accomplished.

The literature of the Anthicidae has suffered from this lack of a world generic study. Species described in *Anthicus* are quite effectively lost in the genus, particularly if only details of color and pubescence are mentioned in the description, as is often the case. In order to avoid creating synonymy, I have checked the descriptions of species from all adjacent areas and compared Micronesian examples with specimens in the British Museum and in the Pic Collection, Museum National d'Histoire Naturelle, Paris. The species described as new in this paper were not represented in those collections, as far as I can tell.

Distribution of Micronesian Anthicidae

	Micronesian Island Groups												
					Caroline								
	Bonin	Volcano	N. Mariana	S. Mariana	Palau	Caroline Atolls	Truk	Ponape	Kusaie	Marshall	Gilbert	Wake	Other Localities
1. Formicomus imperator	×	×		×	×								India, Japan, etc.
2. Anthicomorphus pacificus*								×					
3. Anthicus oceanicus			×	×	×	×	×	×	×	×	×		Marquesas, Ryukyus, possibly to N. Australia and Indian Ocean islands, Ocean I.
4. A. vexator*						×				×	×	×	Canton I., Hawaiian Is.
5. A. insularis*					×				×	×			
6. A. carolinensis*					×				×				
7. A. dybasi*				×	×								
8. A. confucii				×									Japan, China.
9. A. tobias				×									S. Asia, mainland United States, Hawaiian Is.

* Described as new.

Key to Micronesian Species of Anthicidae

1. Prothorax deeply constricted, with anterior lobe bulbous and grooved down middle; elytral humeri completely obsolete and metathoracic wings vestigial .... **1. Formicomus imperator**

   Prothorax not bulbous anteriorly or grooved down middle; elytral humeri and metathoracic wings well developed **2**

2(1). Elytral pubescence single, except for the few tactile setae, of uniform length and all directed the same way **3**

   Elytral pubescence double, consisting of one layer of longer setae directed backward and another layer beneath this, of shorter and more appressed setae, directed obliquely laterally, in addition to tactile setae **5**

3(2). Head rounded behind eyes; male antennae strongly ciliated and longer than those of female; color uniformly tan; length almost 4 mm. .... **2. Anthicomorphus pacificus**

   Head at least subtruncate; male antennae not elongate and ciliate; color not uniformly tan; length less than 3.5 mm. **4**

4(3). Each elytron pale at base and with a conspicuous pale spot at apical third; elytral pubescence moderately dense and fine, silky .... **9. Anthicus tobias**
Elytra obscurely paler at base and beyond middle but without pale spots; elytral pubescence very sparse, short; head strongly microreticulate .... **8. A. confucii**

5(2). Mesepisterna normal, not divided into anterior and posterior zones by a fine groove 6
Mesepisterna divided into anterior and posterior zones by fine, straight grooves, which are almost perpendicular to axis of body 8

6(5). First abdominal sternum without pubescence-filled pits on sides behind hind coxae; dark, legs partly paler; pubescence fine and dense; prothorax very finely and densely punctured .... **5. A. insularis**
First abdominal sternum with lateral pubescent pits; elytra with some pale markings 7

7(6). General color dark, elytra with four isolated transverse rufous spots; pubescence of elytra not especially long .... **6. A. carolinensis**
General color pale; elytra dark with two bands, more or less interrupted at suture, and apex, narrowly pale; elytral pubescence long and somewhat shaggy .... **7. A. dybasi**

8(5). Head and pronotum finely and densely punctured, punctures separated by no more than their own diameters .... **3. A. oceanicus**
Punctures scattered on posterior portion of head, separated by much more than their own diameters, and not as dense as in *oceanicus* even anteriorly; intervals often strongly microreticulate .... **4. A. vexator**

Genus **Formicomus** LaFerté

Formicomus LaFerté, 1848, Monogr. Anthicus et genres voisins, 70.—Pic, 1911, Coleopt. Cat. **17** (36): 15 (see for further references and synonymy).
Anthelephilus LaFerté, 1848, op. cit., 65.
Formicomus (*Anthelephilus*), Pic, 1911, op. cit., 16.

This genus is widespread in the Old World, including Australia, but is not known from the New; several species assigned to it from South America belong in other genera. The generic name has been used for so long that I have no inclination to make the change that would be necessary if strict page priority were applied. *Anthelephilus* includes a small number of flightless species, in which the elytral humeri are rounded. It may be necessary to split up the genus *Formicomus* at some time; the name *Anthelephilus* may come back into use then on a different basis.

1. **Formicomus imperator** (LaFerté) (figs. 1; 2, *a*).
Anthelephilus imperator LaFerté, 1848, Monogr. Anthicus et genres voisins, 66, pl. 24, fig. 2.—Krekich-Strassoldo, 1913, Wiener Ent. Zeitung **32**: 231 (synonymy).
Anthicus formicarius Nietner, 1856, Asiatic Soc. Bengal, Jour. **1856**: 533; 1857, Ann. Mag. Nat. Hist. II, **19**: 383; apud Krekich-Strassoldo, loc. cit.
Anthicus quisquilarius Nietner, 1857, Roy. Asiatic Soc. Ceylon, Jour. **1857**: 22 (reprint pagination); apud Krekich-Strassoldo, loc. cit.

Anthelephilus cribriceps Marseul, 1876, Soc. Ent. France, Ann. VI, **5**: 459; apud Krekich-Strassoldo, loc. cit.

Formicomus (*Anthelephilus*) *imperator,* Pic, 1911, Coleopt. Cat. **17** (36): 18.—Blair, 1942, B. P. Bishop Mus., Bull. **172**: 57.

This is a very distinctive species, even in the large genus *Formicomus.* Male with lobes of hypopygium somewhat modified, as is usual in the genus (fig. 1, *a*); female with ridge on last exposed abdominal tergum, this ridge forming a short, compressed spine above apex of segment. Shiny, tan to brown, with a very slightly oblique, narrow, white pubescent band across middle of each elytron and another, more oblique and much less distinct near base. Except for the three specimens from Koror which are mostly brown, most Micronesian specimens are pale tan, with elytra darker behind.

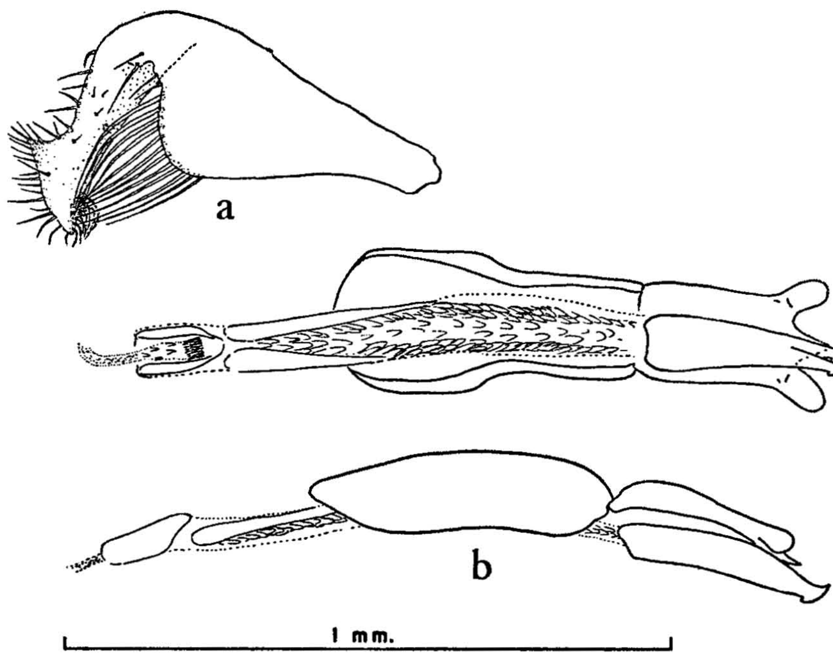


FIGURE 1.—*Formicomus imperator,* Saipan: **a**, lateral view of right lobe of male hypopygium; **b**, ventral and left lateral views of aedeagus.

Male from Saipan 3.11 mm. long to tip of elytra. Head 0.67 mm. long to fronto-clypeal suture, 0.73 wide across eyes and 0.67 behind. Eyes 0.18 by 0.14 mm., separated by 0.56. Last segment of maxillary palpi 0.20 by 0.13 mm. Antennal measurements (in 0.01 mm., from base to apex, length to width): 15/9, 9/6, 13/6, 13/6, 10/6, 12/6, 12/8, 12/9, 15/12, 13/13, 20/13. Prothorax 0.78 mm. long, 0.36 wide at base, 0.28 at constriction, 0.58 maximum and 0.26 at collar. Elytra 1.66 mm. long, about 0.38 wide across base and 0.93 maximum. Tactile setae on elytra 0.15 mm. long, decumbent setae 0.06. Front femora 0.64 by 0.19 mm., front tibiae 0.56 by 0.08 and hind femora 0.93 by 0.23.

Male aedeagus with tegmen rather flat and barely forming a channel for penis, three-lobed at apex; penis cleft apically, each half irregularly hastate at tip; internal

sac bearing many digitiform papillae throughout length; gonopore armature well sclerotized and bilaterally symmetrical.

DISTRIBUTION: Sunda Is., Ceylon, India, Japan, Chusan Archipelago, Ryukyu Is. (Okinawa, F. Werner, collector), Bonin Is., Volcano Is., S. Mariana Is., Caroline Is.

BONIN IS. CHICHI JIMA: July 1951, Bohart; Okumura (Yankee Town) and Omura (Camp Beach), May-June, 1958, Snyder; Yoake Yama, Apr. 1958, Snyder.

VOLCANO IS. IWO JIMA: June 1958, Snyder.

S. MARIANA IS. SAIPAN: As Mahetog area, on *Pandanus,* Mar. 1945, Dybas; Papago area, May 1945, Dybas; Kalabera area, Jan. 1945, Dybas; Chalan Laulau area, on leaf of eggplant, May 1945, Dybas; nr. Hagman Point, Apr. 1945, Dybas; Tuturam-Laulau Bay, beaten from vegetation, Jan. 1945, Dybas; Halaihai-As Teo area, beaten from vegetation, Jan. 1945, Dybas; Kobler Field, Mar. 1958, Krauss; Garapan, Apr. 1946, Krauss; Donnay-Sadog Tasi, May 1940, Yasumatsu and Yoshimura; Mt. Tagpochau, 375 m., Feb. 1945, Dybas. TINIAN: northeastern slope of Mt. Lasso, Apr. 1945, Dybas; ridge north of Tinian Harbor, Apr. 1945, Dybas. GUAM: Piti, pumpkin leaves, July 1936, Swezey, swept from lawn grass, Nov. 1936, Swezey; Umatac, Oct. 1957, Krauss; Pago Bay, swept, June 1945, Dybas; Fadian, on *Sida,* Aug. 1936, Swezey; Fonte Valley, weeds, Aug. 1936, Swezey; Yona, dead leaves, Apr. 1936, Swezey; Machanao, Aug. 1936, Swezey; Inarajan, Sept. 1936, Swezey; Talofofo, Apr. 1946, Krauss; 1 mi. southeast of Asan, 600-800 ft., in decaying coconut logs, Oct. 1947, Dybas.

PALAU. KOROR: Nov. 1947, Dybas.

Genus **Anthicomorphus** Lewis

Anthicomorphus Lewis, 1895, Ann. Mag. Nat. Hist. VI, **15**: 428.

This genus, characterized by the long and thick antennae of the male, is distributed from Japan to New Guinea, and possibly to Australia. Less than 30 species have been described, the largest number from the Philippines. All of the species are of rather large size. They seem to be relatively rare.

2. **Anthicomorphus pacificus** Werner, n. sp.

Characterized by its uniformly tan color and, in the Micronesian fauna, by the long, heavy, strongly ciliate male antennae.

Holotype male, length 3.98 mm. Head oval, with very prominent eyes, 0.67 mm. long, 0.77 wide across eyes and 0.63 behind, temporal angles absent. Frontoclypeal suture fine. Surface shiny, with rather sparse but well-defined punctures; pubescence sparse, decumbent; tactile setae erect but very short and barely reaching above other setae. Eyes 0.35 by 0.26 mm., separated by 0.38. Last segment of maxillary palpi 0.26 by 0.13 mm. Antennal segments 3 to 10 subtriangular, markedly ciliate. Measurements: 22/13, 8/9, 20/10, 19/10, 19/10, 18/10, 20/10, 19/10, 18/10, 20/13, 32/15. Prothorax narrowly campanulate, with well-defined basal impressed line and collar, and with con-

striction at basal third; length 0.81 mm., width at base 0.56, at constriction 0.46, maximum 0.61 and at collar 0.28. Surface similar to head but with flat, crateriform punctures on basal half of disc. Elytra subparallel, 2.50 mm. long, 0.90 wide across humeri and 1.08 maximum. Surface shiny, with fine punctures and rather sparse pubescence 0.08 mm. long; tactile setae erect and about 0.08 mm. long. Transverse impression very feeble. Underside very finely punctured and pubescent, mesepisterna, mesepimera, and abdominal sterna also microreticulate. Round pubescent pits clearly present on sides of prothorax and laterally on first abdominal sternum, and probably also behind mesepimera, which are narrowly exposed and fringed posteriorly. Front femora 0.77 by 0.19 mm., front tibiae 0.67 by 0.08 and hind femora 0.90 by 0.20. (The aedeagus has not been dissected from the holotype.)

Allotype female also 3.98 mm. long; similar to male but antennae shorter and not ciliate. Antennal measurements: 20/10, 8/9, 15/9, 13/10, 13/10, 12/10, 12/10, 12/10, 12/11, 12/12, 20/12.

Holotype, male (US 65941), Ponape, Mt. Temwetemwensekir (Tamatamansakir), slope, about 150-300 m., beating vegetation in secondary forest, Feb. 29, 1948, Dybas. Allotype, female (CM), north slope Mt. Kupuriso, about 300-450 m., beating vegetation, Mar. 11, 1948, Dybas.

DISTRIBUTION: Caroline Is. (Ponape).

Genus **Anthicus** Paykull

Anthicus Paykull, 1798, Ins. Suec. 1: 253.—Pic, 1911, Coleopt. Cat. **17** (36): 29 (references).

As presently constituted, this is one of the very large genera of animals; there is little doubt that many perfectly valid and even unrelated genera are hidden in it. Some of these have been separated off in the European and Nearctic faunas, but the residue is still extremely unwieldy. At least part of the Micronesian species will undoubtedly be assigned to other genera when a worldwide generic revision is undertaken.

3. **Anthicus oceanicus** LaFerté (figs. 2, *b*; 3, *a*).

Anthicus oceanicus LaFerté, 1848, Monogr. Anthicus et genres voisins, 170.—Pic, 1911, Coleopt. Cat. **17** (36): 64 (bibliography and distribution).

Anthicus oceanicus var. *guamensis* Blair, 1942, B. P. Bishop Mus., Bull. **172**: 57. (New synonymy.)

Male (cotype of var. *guamensis* Blair, Umatac, Guam): Length 3.02 mm. Head subquadrate, with eyes protruding, 0.49 mm. long, 0.60 wide across eyes and 0.54 behind. Surface evenly convex, densely and rather finely punctured, punctures about 0.02 mm. from center to center and about as wide as intervals, which are smooth and shiny. Even midline of front is punctured. Eyes 0.27 by 0.23 mm., separated by 0.38. Frontoclypeal suture fine and poorly defined. Antennae with segments slightly narrowed at base, not modified, smooth, with some long, 0.09 mm. setae in addition to rather coarse decumbent setae. Measurements: 18/8, 9/5, 13/5, 13/5, 14/6, 14/7, 14/7, 13/7, 13/8, 10/8, 17/8. Last segment of maxillary palpi 0.20 by 0.10 mm. Prothorax broadest near front, sides converging to constriction, which is close to base; disc evenly convex; length 0.61 mm., width across base 0.42, at constriction 0.40, maximum 0.54 and

across sharply set off collar 0.23. Basal impressed line deep and sharp. Surface as densely punctured as head but punctures slightly broader and flat-bottomed. Tactile setae of head and prothorax erect and about 0.10 mm. long. Elytra subparallel, widest at about middle, with a barely perceptible transverse impression, 0.92 mm. long, 0.70 wide at humeri and 1.02 maximum. Punctures well defined, from about 0.04 to 0.05 mm. from center to center, bearing erect tactile setae and upper layer of longitudinal subdecumbent setae about 0.08 mm. long. Intervals shiny and smooth but bear under layer of rather sparse, appressed setae, about 0.03 mm. long, which are mostly directed obliquely laterally. Underside shiny, finely punctured. Pygidium flat, edge beaded, sculptured portion 0.08 mm. long and 0.26 wide. Front femora 0.59 by 0.18 mm., front tibiae 0.54 by 0.06 and hind femora 0.74 by 0.19.

Male aedeagus with tegmen flattened, simple at apex but with conspicuous, well-sclerotized lobes ventrally at base; internal sac with many short, broad spines; gonopore armature simple, apparently radially symmetrical, consisting of a straight tube and a small corona of fine spines or ridges.

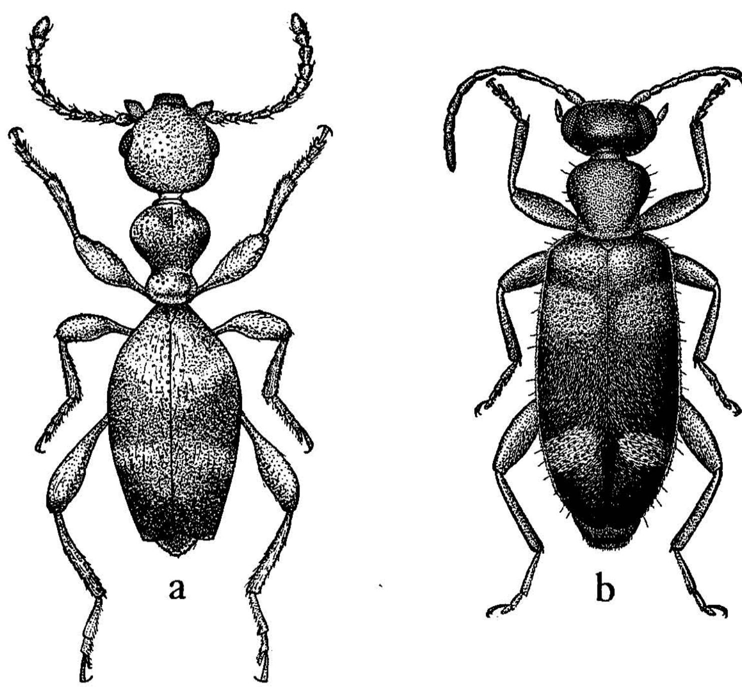


FIGURE 2.—a, *Formicomus imperator*; b, *Anthicus oceanicus*.

DISTRIBUTION: Marquesas Is., Hawaiian Is., Fiji Is., New Hebrides, New Caledonia, Society Is., Krakatao, N. Australia, Cocos Keeling Is., Ceylon, Seychelles, Micronesia.

N. MARIANA IS. AGRIHAN: July 1951, Bohart.

S. MARIANA IS. SAIPAN: As Mahetog area, Nov. 1944, May 1945, Dybas; Achugau area, Dec. 1944, Dybas; 1-2 mi. east of Tanapag, Jan. 1945, Dybas; 1 mi. north-northeast of summit, Mt. Tagpochau, Jan. 1945, Dybas;

Chalan Kanoa, May 1940, Yasumatsu and Yoshimura. TINIAN: Marpo Valley, Nov. 1945, Dybas. ROTA: Sosan Isthmus, Oct. 1945, Necker. GUAM: Pt. Oca, light trap, May-July 1945, Bohart and Gressitt; Piti, June 1936, Swezey; Fonte Valley, Aug. 1936, Swezey; Pt. Ritidian, light trap, Aug. 1945, Gressitt; Machanao, June 1936, Usinger; Mt. Chachao, May 1936, Swezey; Mt. Topatchau, Feb. 1949, Maehler.

PALAU. BABELTHUAP: Ulimang, at light and in mango bark, Dec. 1947, Dybas; Ngerehelong, Dec. 1947, Dybas, May 1957, on mud and stones, Sabrosky; Ngiwal, light trap, Dec. 1952, Gressitt; E. Ngatpang, 65 m., light trap, Dec. 1952, Gressitt; Ngaremeskang, Dec. 1952, Gressitt; Imeliik, April 1954, Beardsley; Ngaremlengui, at light, June 1957, Sabrosky. PELELIU: Akarokuru, Aug. 1939, Esaki; north central region, at light and beaten from vegetation, July 1945, Dybas; east coast, Aug. 1945, Dybas. ANGAUR: Feb. 1948, Dybas. NGARMALK: N. W. Auluptagel, light trap, Feb. 1952, Gressitt.

YAP. YAP: Kolonia, Dugor, Kanif, Tomil Dist. and N. Yap I., July-Aug. 1950, Goss; Yap, hill behind Kolonia, 50 m., light trap, Dec. 1952, Gressitt.

CAROLINE ATOLLS: ULITHI: Potangeras I., Nov. 1947, Dybas.

TRUK. WENA (Moen): Civ. Ad. area, Feb.-Apr. 1949, Potts. TOL: Mt. Unibot, 200 m., light trap, Dec. 1952, Gressitt.

PONAPE. Colonia, Nov. 1953, Beardsley; June-Sept. 1950, Adams; Agric. Expt. Sta., light trap, and light trap at stream pools, Jan. 1953, Gressitt; S.E. Nanpohnmal, 70 m., light trap in cut native forest, Jan. 1953, Gressitt.

KUSAIE. Mutunlik, Jan.-Mar. 1953, Clarke; light trap, Jan. 1953, Gressitt.

MARSHALL IS. JALUIT: Jabwar I., Apr.-May 1958, Gressitt; Majurirok I., Apr. 1958, Gressitt. ARNO: July 1950, La Rivers; Ine I., on dead *Scaevola,* June 1950, Usinger. WOTHO: Wotho I., Oct. 1953, Beardsley. UTIRIK: On dead *Pandanus* trunk, Nov. 1952, Fosberg. NAMU: Namu I., on *Cocos,* Oct. 1953. KWAJALEIN: Lojjaiong, Wallace.

GILBERT IS. ONOTOA: Buiartum I., at light, Aug. 1951, Moul; Butaritari I., Dec. 1957, Krauss. TARAWA: Teaoraeke I., Naanikai I., Banraeba I., and Bairiki I., Nov.-Dec. 1957, Krauss.

OCEAN I. Banaba, Dec. 1957, Krauss.

This species has been collected throughout Micronesia, except for the Bonins and Wake Island. It was described from the Marquesas Islands, subsequently reported from the Hawaiian Is., Fiij Is., New Hebrides, New Caledonia, Society Is., Krakatao, N. Australia, Cocos Keeling Is., Ceylon, and Seychelles (Blair, 1942). All specimens seen from Hawaii have turned out to be misidentified specimens of *A. vexator.* Since there is a chance of further misidentification, the other localities cited must also be verified. One specimen from Okinawa, Ryukyu Is., collected by the author, agrees very well with specimens from the Marianas.

This is the most widely distributed anthicid in Micronesia and extends beyond this area. In the more prevalent color form, found from the Palaus to the Gilberts and probably all the way to the Marquesas, the type locality, the body and appendages are brunnescent and the elytra predominantly dark with oblique posterior pale spots and isolated or confluent pale spots at the level of the transverse impression. The anterior spots tend to be isolated in samples from the Carolines, and confluent across the suture in those from the Marshalls and Gilberts. Specimens from the Marianas tend to be pale, as has already been remarked by Blair. In these, the body and appendages are usually rufescent and the elytra have the dark markings reduced to a fairly broad median band and narrow zones across the base and apex. The median band may be invaded anteriorly at the suture. The length varies from 2.62 to 3.65 mm. in the long series studied.

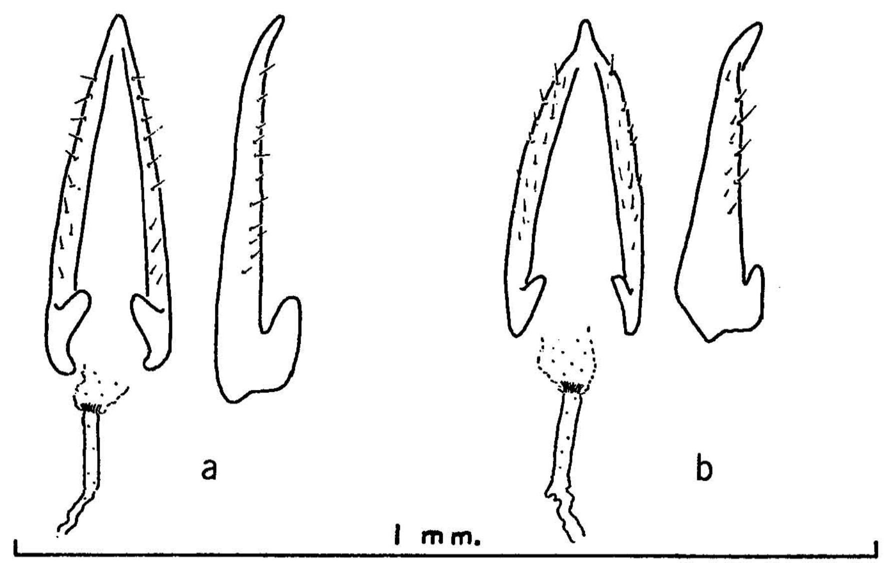


FIGURE 3.—Ventral and left lateral views of tegmen of aedeagus and gonopore armature: **a**, *Anthicus oceanicus*, Saipan; **b**, *A. vexator*, paratype, Buiartum.

4. **Anthicus vexator** Werner, n. sp. (fig. 3, *b*).

Holotype male, length 3.63 mm. Head subtriangular, with protuberant eyes; base almost straight, but feebly and broadly excavated in middle; length 0.56 mm., width across eyes 0.79, behind eyes 0.72. Punctures well defined, sparse, separated by as much as twice their diameters, or even more on occiput, becoming denser laterally and especially anterolaterally; intervals finely but distinctly microreticulate throughout. Front slightly flattened. Eyes 0.36 by 0.28 mm., separated by 0.44. Frontoclypeal suture fine but distinct. Antennae similar to those of *oceanicus;* measurements 22/9, 10/6, 15/6,

15/7, 15/8, 14/9, 14/9, 13/10, 13/10, 12/10, 18/10. Last segment of maxillary palpi 0.23 by 0.13. Prothorax almost as in *oceanicus,* with intervals between dense punctures smooth; 0.74 mm. long, 0.52 wide at base, 0.49 at constriction, 0.69 maximum and 0.27 at collar. Elytra 2.33 mm. long, 0.96 wide at humeri and 1.25 maximum. Underside as in *oceanicus* but fringe of setae on mesepisterna longer and denser. Sculptured portion of pygidium 0.08 mm. long and 0.32 wide. Front femora 0.72 by 0.22 mm., front tibiae 0.61 by 0.08 and hind femora 0.90 by 0.24.

Male aedeagus similar to that of *oceanicus* but tegmen broader and lobes at its base less well sclerotized; other parts almost identical with those of *oceanicus.*

Allotype female, length 3.78 mm. Very similar to male, with front femora slightly more slender, 0.72 by 0.20 mm.

Holotype, male (US 65942), Buiartum I., Onotoa A., Gilbert Is., at light, Aug. 3, 1951, Moul. Allotype, female (BISHOP 3062), same data. Paratypes: 24 males, 36 females, same data. Male, Bairiki I., Tarawa A., Gilbert Is., Nov. 1957, Krauss. Male, Fuasubukoru, Faraulep A., Caroline Atolls, Feb. 4, 1953, Beardsley. 16 males, four females, Jobtan Islet, Eniwetok A., Marshall Is., Nov. 11, 1944, Hagen. Seven males, two females, Eniwetok I., Eniwetok A., Marshall Is., Nov. 8-11, 1944, Dybas. Seven males, two females, Sibylla I., Pokak A., Marshall Is., July 21-27, 1952, Fosberg. Male, Wotho A., Marshall Is., Feb. 12-15, 1952, Fosberg. Male, female, Majuro A., Marshall Is., July 4, 1950, La Rivers. Female, Bikar A., Marshall Is., Aug. 7, 1952, Fosberg. Two males, Bikar A., on *Portulaca lutea,* Aug. 10, 1952, Fosberg. Male, six females, Kwajalein A., Marshall Is., April 24, 1958, Gressitt; three males, in grass nest in sand, Dec. 31, 1952, Clarke. Male, Ebeye I., Kwajalein A., Marshall Is., Oct. 12, 1953, Beardsley. Three males, Wake I., Aug. 1, 1937, Hadden. Male, Canton I., housing area, April 1951, Degener; male, Canton I., May 1940, Langford. Three males, female, Koko Head, Oahu, Hawaiian Is., "2-5-11." Two males, two females, Kanapou, Kahoolawe, Hawaiian Is., Feb. 14, 1931, Bryan. Two females, Kaunakakai, Molokai, Hawaiian Is., under board on beach, Sept. 24, 1930, Swezey; female, Kaunakakai, Molokai, Hawaiian Is., July 1893, Perkins.

DISTRIBUTION: Caroline Atolls (Faraulep), Marshall Is. (Eniwetok, Pokak, Wotho, Majuro, Bikar, Kwajalein), Gilbert Is. (Onotoa, Tarawa), Wake Is., Canton I., Hawaiian Is. (Oahu, Molokai, Kahoolawe).

This species is generally similar to *A. oceanicus* and has been consistently misidentified with it in the past. In addition to much sparser punctures on the head and often microreticulate intervals, there are some rather constant differences in color pattern. In *vexator* the legs are almost always contrastingly paler than the rest of the body; in *oceanicus* they are only slightly, if at all, paler. The posterior pale spots on the elytra tend to be about as long as broad in *vexator* and distinctly broader than long and noticeably oblique in *oceanicus.* The samples of *vexator* from the Gilberts and Wake I. have the body rufescent and the anterior elytral spots tending to anastomose across the suture; those from the Marshalls are mostly brunnescent, with isolated elytral spots. The

length varies from 2.93 to 3.80 mm. in the series measured, slightly larger than *oceanicus*.

5. Anthicus insularis Werner, n. sp. (fig. 4).

Holotype male, length 2.90 mm. Head subquadrate, eyes prominent, 0.44 mm. long, 0.64 wide across eyes and 0.58 behind. Surface very densely and finely punctured, intervals not evident; pubescence moderately dense but fine and not conspicuous, decumbent; tactile setae erect, not conspicuous. Frontoclypeal suture distinct. Eyes 0.31 by 0.26 mm., separated by 0.33. Last segment of maxillary palpi 0.18 by 0.10 mm. Antennae with segments widest near apex; measurements 18/8, 9/5, 14/5, 15/6, 13/6, 12/6, 12/6, 10/6, 10/6, 10/8, 13/8. Prothorax subpentagonal, widest near anterior, where angle is sharper than in other Micronesian species; collar unusually short and inconspicuous; basal impressed line distinct. Length 0.54 mm., width 0.42 at base, 0.41 at constriction, 0.56 maximum and 0.20 at collar. Surface as densely punctured as head but punctures slightly larger. Elytra subparallel, widest at about middle, with weakly marked omo-

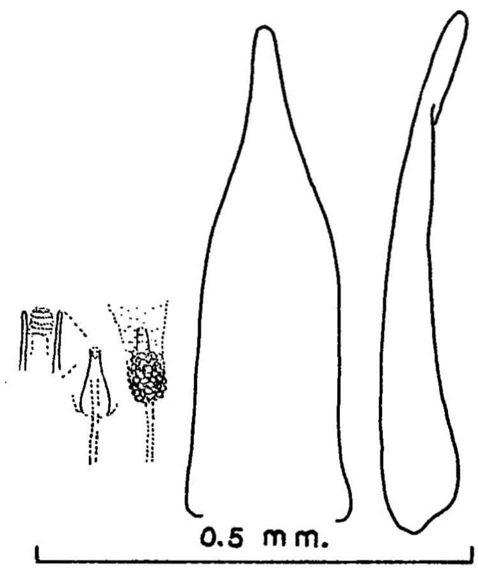


FIGURE 4.—*Anthicus insularis*, paratype, Kusaie, ventral and left lateral views of tegmen of aedeagus and gonopore armature.

plates and transverse impression; slightly truncate at apex; 1.92 mm. long, 0.74 wide at humeri and 0.95 maximum. Surface shiny, with small punctures bearing the longer setae and very tiny punctures the shorter setae. Tactile setae erect, slender, 0.06 mm. long; upper layer of setae longitudinal, fine, dark, subdecumbent and slightly curved, 0.06 long; under layer mostly directed obliquely laterally, appressed, about 0.03 long. Underside finely punctured and pubescent, including mesepisterna, which have no dividing line. Mesepimera and first abdominal sternum without pubescent pits. Pygidium without a sharp anterior border on sculptured portion, which is about 0.14 mm. long and 0.42 wide. Front femora 0.64 by 0.20 mm., front tibiae 0.51 by 0.08 and hind femora 0.72 by 0.20.

Male aedeagus with tegmen simple, pointed; internal sac almost simple but with a zone of short spines or thickenings next to gonopore armature; gonopore armature radially symmetrical, consisting of a small tube with a patch of fine spines or thickenings inside apex.

Allotype female, length 2.93 mm. Very similar to male. Front femora slightly more slender, 0.61 by 0.18 mm.

Holotype, male (US 65943), Pukusrik, Kusaie, Caroline Is., mangrove area, 1 m., light trap, Apr. 3, 1953, Clarke. Allotype, female (US), same data. Paratypes: 10 males, eight females, topotypical, Feb. 13-Apr. 24, 1953, Clarke. Male, Ngerabad, Koror I., Palau Is., at light, Apr. 17, 1957, Sabrosky. Also included but not designated as paratypes: Male, female, Majuro A., Marshall Is., July 4, 1950, La Rivers.

DISTRIBUTION: Caroline Is. (Kusaie, Palau), Marshall Is. (Majuro).

This is a piceous species, with the head and angulate prothorax very densely and finely punctured, and the whole insect clothed with fine, short pubescence. The first two antennal segments, trochanters, tarsi, and tibiae may be pale. The series from Kusaie varies in length from 2.66 to 2.93 mm. and the single specimen from the Palaus falls in this range. The two specimens from Majuro, Marshall Is., are close to 3.5 mm. long and both have the head less densely punctured than the others; the aedeagus of the Majuro male is almost identical with that of a specimen from the type locality, however.

6. **Anthicus carolinensis** Werner, n. sp. (fig. 5, *a*).

Brown, shiny, with large and distinctly separated punctures on dorsal surface; fore coxae, all femora, apices of tibiae, and all of tarsi luteous; mouthparts and at least apical segments of antennae rufescent; each elytron with two distinct, isolated rufescent spots, anterior in region of transverse impression and subquadrate, posterior at apical third, transverse and slightly oblique. Length from 3.00-3.58 mm. One female from Babelthuap, doubtfully associated with this species, has similar pale markings on elytra but they are narrow, almost complete, transverse bands, posterior slightly interrupted at suture. Underside of this specimen rufescent, legs mostly brown, only trochanters, apices of femora, bases and apices of tibiae, and all of tarsi paler; prothorax of this specimen much more densely punctured than head, prothoracic punctures separated by less than their diameters.

Holotype male, length 3.08 mm. Head subquadrate, eyes protuberant; length 0.49 mm., width across eyes 0.69 and behind 0.59. Base gently rounded, almost straight, shallowly excavated at middle; disc slightly flattened. Surface smooth, shiny, rather deeply and evenly punctured, with very sparse punctulation on intervals, large and tiny punctures bearing longer and shorter decumbent setae, respectively. Frontoclypeal suture fine. Eyes 0.33 by 0.26 mm., separated by 0.38. Last segment of maxillary palpi 0.18 by 0.08 mm. Antennal segments widest near apex; measurements 19/10, 10/6, 13/7, 14/8, 14/8, 15/8, 15/8, 15/8, 13/8, 13/8, 18/8. Prothorax subcampanulate, disc slightly flattened and basal impressed line and collar distinct. Surface and pubescence similar to those of head. Length 0.61 mm., width at base 0.49, constriction 0.49, widest 0.58 and collar 0.26. Elytra widest just behind middle, 1.98 mm. long, 0.79 wide at humeri and 1.10 maximum. Surface shiny and deeply punctured, much as on head and pronotum. Tactile setae erect, fine, 0.10 mm. long; upper layer of pubescence decumbent, curved, 0.08 to 0.12 mm. long, and lower layer appressed, about 0.04 long. Underside shiny, sparsely punctulate and sparsely pubescent. Hind margin of mesepisterna fringed,

fringe apparently covering a pit; sides of first exposed abdominal sternum with transverse, pubescence-covered pits. Sculptured portion of pygidium 0.09 mm. long and 0.26 wide. Front femora 0.64 by 0.18 mm., front tibiae 0.51 by 0.08 and hind femora 0.70 by 0.18.

Male aedeagus with tegmen simple but laterally concave near apex and quite densely pubescent; internal sac simple; gonopore armature consisting of a tube ending in a bilaterally symmetrical patch of setae or ridges.

Allotype female, length 3.35 mm. Similar to male but front femora slightly more slender, 0.67 by 0.18 mm.

Holotype, male (US 65944), Pukusrik, Kusaie, Caroline Is., mangrove area, 1 m., light trap, Apr. 2, 1953, Clarke. Allotype, female (US), same data. Paratypes: Three males, three females, topotypical, Apr. 2, 3, 1953; female,

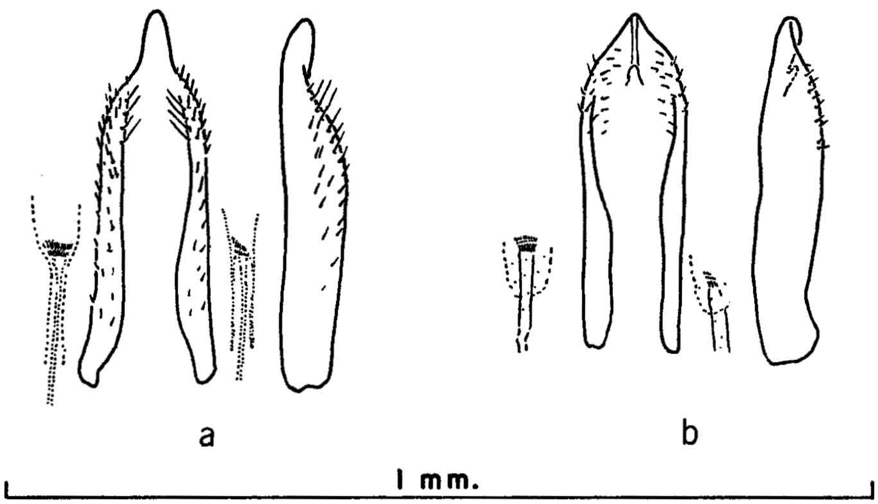


FIGURE 5.—Ventral and left lateral views of tegmen of aedeagus and gonopore armature: **a**, *Anthicus carolinensis*, paratype, Kusaie; **b**, *A. dybasi*, paratype, Koror.

[Mt.] Tafeayat, Kusaie, Caroline Is., 518 m., Feb. 9, 1953, Clarke. Also included but not designated a paratype: female, Ngerehelong, Babelthuap, Palau Is., May 8, 1957, Sabrosky.

DISTRIBUTION: Caroline Is. (Kusaie, Palau).

7. Anthicus dybasi Werner, n. sp. (fig. 5, *b*).

Rufescent, legs slightly paler, elytra with piceous markings that leave two fairly wide bands, one at transverse impression, other behind middle and extending forward slightly at suture, pale. Apex also obscurely pale. Head and prothorax shiny, the latter with deep and isolated punctures. Pubescence shaggy. Length from 2.43 to 2.87 mm.

Holotype male, length 2.61 mm. Head subquadrate, smooth and shiny, with scattered punctures, disc evenly convex; 0.41 mm. long, 0.59 wide across eyes and 0.49 behind. Pubescence sparse, subdecumbent, rather long, with erect tactile setae. Eyes prominent, 0.26 by 0.17 mm., separated by 0.37. Frontoclypeal suture fine, transverse. Antennae with segments narrowly moniliform; measurements 15/6, 8/5, 10/5, 13/5,

13/5, 12/6, 12/6, 12/6, 13/7, 13/7, 20/8. Last segment of maxillary palpi 0.13 by 0.07 mm. Prothorax subcampanulate, coarsely and rather densely punctured, occasional punctures running together. Punctures round-bottomed; intervals smooth and shiny. Basal impressed line and collar distinct; disc not flattened. Length 0.54 mm., width across base 0.38, at constriction 0.35, maximum 0.49 and at collar 0.20. Elytra widest just before middle, tapering gradually before and behind; 1.66 mm. long, 0.61 wide across humeri and 0.86 maximum. Surface shiny, with deep punctures almost like those on prothorax but sparser. Tactile setae stout, erect, 0.18 mm. long; upper layer of setae subdecumbent, fine, 0.09 mm. long; lower layer very fine and inconspicuous, less than 0.04 mm. long. Underside shiny, smooth, very finely and sparsely punctulate and sparsely pubescent. Mesepisterna with a dense fringe of setae behind, apparently covering a pit on the mesepimera; sides of first abdominal sternum also with round, pubescence-covered pits. Sculptured portion of pygidium flat, edge narrowly beaded, 0.09 mm. long and 0.18 wide. Tibiae with a few scattered long, subdecumbent setae. Front femora 0.54 by 0.15 mm., front tibiae 0.51 by 0.05 mm. and hind femora 0.61 by 0.15 mm.

Male aedeagus with tegmen simple, ogival at apex and with a ventral keel behind apex; internal sac with many small, short spines; gonopore armature very similar to that of *A. carolinensis*.

Allotype female, length 2.64 mm. Front femora as in male, 0.52 by 0.15 mm.

Holotype, male (US 65945), Koror I., Palau Is., Caroline Is., Nov. 24, 1947, Dybas. Allotype, female (CM), same data. Paratypes: 15 males, 12 females, two damaged, same data as types; female, Koror I., Apr. 6, 1953, Beardsley. Female, sw. Saipan I., S. Mariana Is., beating vegetation, May 7, 1945, Dybas.

DISTRIBUTION: S. Mariana Is. (Saipan), Caroline Is. (Palau).

8. **Anthicus confucii** Marseul.

Anthicus Confucii Marseul, 1876, Soc. Ent. France, Ann. V, **6**: 464.

DISTRIBUTION: Japan, Ryukyu Is., S. Mariana Is.

S. MARIANA IS. SAIPAN: Male, As Mahetog area, at light, Jan. 1945, Dybas.

This is an abundant species in Japan and the Ryukyu Is.

9. **Anthicus tobias** Marseul.

Anthicus Tobias Marseul, 1879, L'Abeille **17**: 125.

Anthicus tobias, Bonadona, 1954, Rev. Franç. Ent. **21**: 119, fig. 19.—Werner, 1962, Psyche **68**: 70-72, figs. 1-3.

DISTRIBUTION: South Asia, mainland United States, Hawaiian Is., S. Mariana Is.

S. MARIANA IS. GUAM: Male, Agana, Oct. 1952, Beardsley.

The species is widely distributed in both hemispheres and is fairly abundant on Oahu, Hawaiian Is., where it has been previously listed erroneously as *A. mundulus* Sharp.